CLAIMS

What we claim as our invention is:

1. A detonator system for detonating cord, comprising:

a firing head having a detonator chamber sized to receive at least a portion of a detonator and having an upper sealing surface and a lower sealing surface, the upper sealing surface adapted for forming a fluid and pressure seal with a firing sub, and

a booster charge holder having an upper sealing surface and a bulkhead adapted for forming a fluid and pressure seal with the firing head lower sealing surface, the bulkhead and booster charge holder upper sealing surface sized to position the bulkhead adjacent an explosive component of a detonator carried in the detonator chamber when the booster charge holder upper sealing surface is engaged with the detonator chamber lower sealing surface and having a booster charge chamber below the bulkhead adapted to receive a booster charge adjacent the bulkhead.

2. A detonator system according to Claim 1, wherein the detonator chamber is sized to receive at least a portion of an electrically fired detonator and the upper sealing surface is adapted for forming a fluid and pressure seal with a wireline firing sub.

3. A detonator system according to Claim 1, further comprising a seal boot having a first end and a second end, the first end having an outer surface sized to form a fluid tight seal with an inner surface of the booster charge chamber and having inner surface sized to form a fluid tight seal with a booster charge carried in the booster charge chamber.

4. A detonator system according to Claim 3, wherein the seal boot second end has an inner surface sized to form a fluid tight seal with a detonating cord.

5. A detonator system according to Claim 4, wherein the seal boot second end has an outer surface having a diameter smaller than a diameter of the outer surface of the seal boot first end, thereby forming a shoulder on the outer surface of the seal boot between the seal boot first end and seal boot second end.

6. A detonator system according to Claim 5, further comprising:

a thread on an outer surface of the booster charge chamber,

a retainer cap having an internal thread coupled to the booster charge chamber thread and having an internal shoulder engaging the shoulder on the outer surface of the seal boot and thereby retaining a portion of the seal boot in the booster charge chamber.

7. A detonator system according to Claim 6, wherein the retainer cap comprises a chamber for receiving the seal boot second end.

8. A detonator system according to Claim 1, wherein the detonator chamber is sized to receive only a portion of a detonator and to position an explosive component of a detonator below the detonator chamber lower sealing surface.

9. A detonator system according to Claim 8 wherein the booster charge holder comprises an upper chamber extending from the upper sealing surface to the bulkhead, the chamber sized to receive a portion of a detonator containing an explosive and to position the explosive portion adjacent the bulkhead.

10. A detonator system according to Claim 1, further comprising:

an electrically fired detonator carried in the detonator chamber, and

a wire line firing sub connected in sealing engagement with the detonator chamber upper sealing surface, and electrically coupled to the electrically fired detonator.

11. A detonator system according to Claim 10, wherein the booster charge holder upper sealing surface is connected in sealing engagement with the detonator chamber lower sealing surface.

12. A detonator system according to Claim 11, further comprising a booster charge carried in the booster charge chamber adjacent the bulkhead.

13. A detonator system according to Claim 12, further comprising a length of detonating cord having one end coupled to the booster charge.

14. A detonator system according to Claim 13, further comprising a seal boot having a first end positioned in the booster charge chamber between the booster charge and an inner surface of the booster charge chamber, and forming a substantially fluid tight seal the booster charge and the inner surface of the booster charge chamber.

15. A detonator system according to Claim 14, wherein the seal boot comprises a second end extending along a portion of the detonating cord and forming a substantially fluid tight seal with the detonating cord.

16. A detonator system according to Claim 15, wherein the seal boot first end has an outer diameter greater than the outer diameter of the seal boot second end, thereby

forming a shoulder on the outer surface of the seal boot between the seal boot first end and seal boot second end.

17. A detonator system according to Claim 16, further comprising:

a thread on an outer surface of the booster charge chamber,

a retainer cap having an internal thread coupled to the booster charge chamber thread and having an internal shoulder engaging the shoulder on the outer surface of the seal boot and thereby retaining a portion of the seal boot in the booster charge chamber.

18. A detonator system according to Claim 17, wherein the retainer cap comprises a chamber for receiving the seal boot second end.

19. A method for detonating detonating cord in a borehole, comprising:

placing a detonator in a firing head chamber,

sealing a first end of the firing head chamber with a firing sub,

sealing a second end of the firing head chamber with booster charge holder having an internal bulkhead positioned below the detonator, and

positioning a booster charge below the bulkhead.

20. A method according to Claim 19, wherein the detonator is an electrically fired detonator and the firing sub is a wireline firing sub.

21. A method according to Claim 19, further comprising:

providing a booster charge chamber below the bulkhead, and

positioning a fluid seal between the booster charge and the booster charge chamber.

22. A method according to Claim 21, further comprising coupling the booster charge to one end of a section of detonating cord within the booster charge chamber.

23. A method according to Claim 22, further comprising positioning a fluid seal between the detonating cord and the booster charge chamber.

24. A method according to Claim 23, further comprising firing the detonator.

25. A method according to Claim 22, further comprising mechanically supporting a borehole explosive tool from the firing head.

26. A method according to Claim 25, further comprising explosively coupling the detonating cord to the explosive tool.

27. A method according to Claim 26, further comprising positioning the firing head and explosive tool in a borehole.

28. A method according to Claim 27, further comprising firing the detonator.